



Practitioner's Dock # No. 2204/C07

PATENT**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Patent application

of _____
Inventor(s)for _____
Title of invention**OR**

In re application of: Johnson, et al.

Application No.: 10/068,472

Group Art Unit: Not yet assigned

Filed: February 8, 2002

Examiner: Not Assigned

For: Optical Device Having Nonmonotonic Transfer Function and Applications Using Same

**Commissioner for Patents
Washington, D.C. 20231****INFORMATION DISCLOSURE STATEMENT****CERTIFICATE UNDER 37 C.F.R. § 1.8(a) and 1.10****(When using Express Mail, the Express Mail label number is mandatory;
Express Mail certification is optional.)*

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Date: May 9, 2002

Signature

Jeffrey T. Klayman

(type or print name of person certifying)

NOTE: "An information disclosure statement shall be considered by the Office if filed by the applicant within any one of the following time periods:

- (1) Within three months of the filing date of a national application other than a continued prosecution application under § 1.53(d);
- (2) Within three months of the date of entry of the national stage as set forth in § 1.491 in an international application;
- (3) Before the mailing date of a first Office action on the merits; or
- (4) Before the mailing date of a first Office action after the filing of a request for continued examination under § 1.114."

37 C.F.R. § 1.97(b).

NOTE: "Each individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section." 37 C.F.R. § 1.56(a).

"Individuals associated with the filing or prosecution of a patent application within the meaning of this section are:

- (1) each inventor named in the application;
- (2) each attorney or agent who prepares or prosecutes the application; and
- (3) every other person who is substantively involved in the preparation or prosecution of the application and who is associated with the inventor, with the assignee or with anyone to whom there is an obligation to assign the application." 37 C.F.R. § 1.56(c).

NOTE: The "duty as described in § 1.56 will be met so long as the information in question was cited by the Office or submitted to the Office in the manner prescribed by §§ 1.97(b)-(d) and 1.98 before issuance of the patent." Notice of January 9, 1992, 1135 O. G. 13 -25 at 17.

WARNING: "No information disclosure statement maybe filed in a provisional application." 37 C.F.R. § 1.51(d).

List of Sections Forming Part of This Information Disclosure Statement

The following sections are being submitted for this Information Disclosure Statement:

(check sections forming a part of this statement: discard unused sections and number pages consecutively)

1. ☒ Preliminary Statements
2. ☒ FORMS PTO/SB/08A and 08B (formerly FORM PTO-1449)
3. ☐ Statement as to Information Not Found in Patents or Publications
4. ☐ Identification of Prior Application in Which Listed Information Was Already Cited and for Which No Copies Are Submitted or Need Be Submitted
5. ☐ Cumulative Patents or Publications
6. ☒ Copies of Listed Information Items Accompanying This Statement
7. ☐ Concise Explanation of Non-English Language Listed Information Items
 - 7A. ☐ EPO Search Report
 - 7B. ☐ English Language Version of EPO Search Report
8. ☐ Translation(s) of Non-English Language Documents
9. ☐ Concise Explanation of English Language Listed Information Items (Optional)
10. ☒ Identification of Person(s) Making This Information Disclosure Statement

(complete the following, if appropriate)

Sections _____, respectively, have been continued on ADDED PAGE(S).

NOTE: "Once the minimum requirements are met the examiner has an obligation to consider the information." Notice of April 20, 1992 (1138 O.G. 37-41, 37).

Section 1. Preliminary Statements

Applicants submit herewith patents, publications or other information, of which they are aware that they believe may be material to the examination of this application, and in respect of which, there may be a duty to disclose.

The filing of this information disclosure statement shall not be construed as a representation that a search has been made (37 C.F.R. § 1.97(g)), an admission that the information cited is, or is considered to be, material to patentability, or that no other material information exists.

The filing of this information disclosure statement shall not be construed as an admission against interest in any manner. Notice of January 9, 1992, 1135 O.G. 13-25, at 25.



SECTION 2: FORM PTO 1449 - MODIFIED

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Johnson, et al.

Atty Dkt: 2204/C07

Serial No: 10/068,472

Date: May 9, 2002

Date Filed: February 8, 2002

Invention: Optical Device Having Nonmonotonic Transfer Function and Applications Using Same

Commissioner for Patents
Washington, DC 20231

LIST OF PATENTS AND PUBLICATIONS FOR APPLICANTS'
INFORMATION DISCLOSURE STATEMENT

U.S. Documents

<u>Exam.</u> <u>Init.</u>	<u>Ref.</u> <u>No.</u>	<u>Document</u> <u>Number</u>	<u>Issue</u> <u>Date</u>	<u>Name</u>	<u>Class</u>
	AA	4,128,300	Dec. 5, 1978	Stotts et al.	350/96.14
	AB	4,262,992	Apr. 21, 1981	Berthold, III	350/96.14
	AC	4,573,767	Mar. 4, 1986	Jewell	350/354
	AD	4,764,889	Aug. 16, 1988	Hinton et al.	364/807
	AE	4,864,536	Sept. 5, 1989	Lindmayer	365/119
	AF	4,894,818	Jan. 16, 1990	Fujioka et al.	370/3
	AG	4,930,873	Jun. 5, 1990	Hunter	350/354
	AH	4,932,739	Jun. 12, 1990	Islam	350/96.15
	AI	4,962,987	Oct. 16, 1990	Doran	350/96.15
	AJ	4,992,654	Feb. 12, 1991	Crossland et al.	250/213
	AK	5,078,464	Jan. 7, 1992	Islam	385/122
	AL	5,144,375	Sept. 1, 1992	Gabriel et al.	356/345
	AM	5,315,422	May 24, 1994	Utaka et al.	359/107
	AN	5,349,593	Sept. 20, 1994	Lomashevitch et al.	372/50
	AO	5,461,507	Oct. 24, 1995	Westland et al.	359/289
	AP	5,479,384	Dec. 26, 1995	Toth et al.	364/14
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AR	5,537,243	Jul. 16, 1996	Fatehi et al.	359/541
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AY	5,999,284	Dec. 7, 1999	Roberts	359/108
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BA	6,041,126	Mar. 21, 2000	Terai et al.	381/71.6
BB	6,044,341	Mar. 28, 2000	Takahashi	704/226

Other Documents

Exam. Ref.

Init. No. Name

- BC ✓ "Wave proagation in nonlinear photonic band-gap materials," Li et al., Physical Review B: Condensed Matter, Vol. 53, No. 23, 15577-15585 (15 June 1996).
- BD ✓ "The Interaction of Electromagnetic Radiation with Magnetic Media," http://www.qub.ac.uk/mp/con/magnetics_group/magnetoptics.html.
- BE ✓ "Three-Dimensional Arrays in Polymer Nanocomposites," Kumacheva et al., Advanced Materials, 1999, 11, No. 3.
- BF ✓ "Intergrable, Low-Cost, All-Optical WDM Signal Processing: Narrowband Hard Limiters and Analog-to-Digital Converters," Sargent et al., January 2000.
- BG ✓ "Nonlinear Distributed Feedback Structures for Optical Sensor Protection," Brzozowski et al., April 2000.
- BH ✓ "Optical Signal Processing Using Nonlinear Distributed Feedback Structures," Brzozowski et al., IEEE Journal of Quantum Electronics, Vol. 36, No. 5, May 2000.
- BI ✓ "All-Optical Analog-to-Digital Converter for Photonic Networks Using Multilevel Signaling," Brzozowski et al., June 2000
- BJ ✓ "Photonic Crystals for Intergrated Optical Computing," Brzozowski et al., June 2000.
- BK ✓ "Nonlinear distributed-feedback structures as passive optical limiters," Brzozowski et al., J. Opt. Soc. Am B, Vol. 17, No. 8, August 2000.
- BL ✓ "Stability of Periodic Nonlinear Optical Structures for Limiting and Logic," Brzozowski et al., September 2000.
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- BN ✓ "Nonlinear Disordered Media for Broad-Band Optical Limiting," Brzozowski et al., IEEE Journal of Quantum Electronics, Vol. 36, No. 11, November 2000.
- BO ✓ "Realization of All-Optical Ultrafast Logic Gates Using Triple Core Asymmetric Nonlinear Directional Coupler," Natasa Trivunac-Vukovic, Journal of Optical Communications, 2001.
- BP ✓ "All-Optical Analog-to Digital Converters, Hardlimiters, and Logic Gates," Brzozowski et al., Journal of Lightwave Technology, Vol. 19, No. 1, January 2001.

- BQ ✓ "Stable All-Optical Limiting in Nonlinear Periodic Structures," Pelinovsky et al., February 8, 2001.
- BR ✓ "All-Optical Signal Processing and Packet Forwarding Using Nonmonotonic Intensity Transfer Characteristics," Johnson, E.V., A thesis submitted in conformity with the requirements for the degree of Master of Applied Science Graduate Department of electrical and Computer Engineering University of Toronto, 2001.
- BS ✓ "Bistable Optical Devices Promise Subpicosecond Switching," Smith et al., IEEE Spectrum, June 1981.
- BT ✓ "Self-Pulsing and Chaos in Distributed Feedback Bistable Optical Devices," Winful et al., American Institute of Physics, February 15, 1982.
- BU ✓ "The Nonlinear Coherent Coupler," Jensen, Stephen M., IEEE Journal of Quantum Electronics, Vol. QE-18, No. 10, October 1982.
- BV ✓ "All Optical Multiple-Quantum-Well Waveguide Switch," Li Kam Wa et al., November 12, 1984.
- BW ✓ "Nonlinear Light Transfer in Tunnel-Coupled Optical Waveguides," Gusovskii et al., Sov. J. Quantum Electron, Vol. 15, No. 11, November 1985.
- BX ✓ "Performance of an 8 X 8 LiNbO₃ Switch Matrix as a Gigahertz Self-Routing Switching Node," Blumenthal et al., October 1, 1987.
- BY ✓ "Ultrafast All-Optical Switching in a Dual-Core Fiber Nonlinear Coupler," Friberg et al., Appl. Phys. Lett. 51 (15), 12 October 1987.
- BZ ✓ "Self-Clocked Optical Control of a Self-Routed Photonic Switch," Perrier et al., Journal of Lightwave Technology, Vol. 7, No. 6, June 1989.
- CA ✓ "Optical Bistability in Semiconductor Periodic Structures," He, J., et al., IEEE Journal of Quantum Electronics, Vol. 27, No. 5, May 1991.
- CB ✓ "Demonstration of Photonic Fast Packet Switching at 700 Mbit/s Data Rate," Ha et al., Electronics Letters, Vol. 27, No. 10, May 9, 1991.
- CC ✓ "Analysis of Optical Bistability in a Nonlinear Distributively Coupled Resonator," Dubovitsky et al., IEEE Journal of Quantum Electronics, Vol. 28, No. 3, March 1992.
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- CE ✓ "Smart Pixels Using the Light Amplifying Optical Switch (LAOS)," Wilmsen et al., IEEE Journal of Quantum Electronics, Vol. 29, No. 2, February 1993.
- CF ✓ "A Terahertz Optical Asymmetric Demultiplexer (TOAD)," Sokoloff et al., IEEE Photonics Technology Letters, Vol. 5, No. 7, July 1993.
- CG ✓ "Compact 40 Gbit/s Optical Demultiplexer Using a GaInAsP Optical Amplifier," Ellis et al., Electronics Letters, Vol. 29, No. 24, November 25, 1993.
- CH ✓ "All Optical Wavelength Conversion by SOA's in a Mach-Zehnder Configuration," Durhuus et al., IEEE Photonics Technology Letters, Vol. 6, No. 1, January 1994.
- CI ✓ "First Demonstration of Multihop All-Optical Packet Switching," Blumenthal et al., IEEE Photonics Technology Letters, Vol. 6, No. 3, March 1994.
- CJ ✓ "Improved All-Optical Switching in a Three-Slab Nonlinear Directional Coupler with Gain," Di Pasquale et al., IEEE Journal of Quantum Electronics, Vol. 30, No. 5, May 1994.

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- CL ✓ "Optical Bistability in Reflective Fiber Gratings," Shi Choa-Xiang, IEEE Journal of Quantum Electronics, Vol. 31, No. 11, November 1995.
- CM ✓ "Monolithically Integrated Asymmetric Mach-Zehnder Interferometer as a 20 Gbit/s All-Optical Add/Drop Multiplexer for OTDM Systems," Jahn et al., Electronics Letters, Vol. 32, No. 3, February 1, 1996.
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- CP ✓ "Design and Implementation of a Fully Reconfigurable All-Optical Crossconnect for High Capacity Multiwavelength Transport Networks," Jourdan et al., Journal of Lightwave Technology, Vol. 14, No. 6, June 1996.
- CQ ✓ "Experimental Demonstration of an All-Optical Routing Node for Multihop Wavelength Routed Networks," Shell et al., IEEE Photonics Technology Letters, Vol. 8, No. 10, October 1996.
- CR ✓ "Supermode Analysis of the Three-Waveguide Nonlinear Directional Coupler: The Critical Power," Artigas et al., Optics Communications, Vol. 131, October 15, 1996.
- CS ✓ "Unbalanced TOAD for Optical Data and Clock Separation in Self-Clocked Transparent OTDM Networks," Deng et al., IEEE Photonics Technology Letters, Vol. 9, No. 6, June 1997.
- CT ✓ "Analysis of Power-Dependent Switching Between Radiatively Coupled Planar Waveguides," Shamonin et al., Journal of Lightwave Technology, Vol. 15, No. 6, June 1997.
- CU ✓ "All-Optical Updating of Subcarrier Encoded Packet Headers with Simultaneous Wavelength Conversion of Baseband Payload in Semiconductor Optical Amplifiers," Vaughn et al., IEEE Photonics Technology Letters, Vol. 9, No. 6, June 1997.
- CV ✓ "Optical Rate Conversion for High-Speed TDM Networks," Patel et al., IEEE Photonics Technology Letters, Vol. 9, No. 9, September 1997.
- CW ✓ "Temporal Solitary Subpicosecond Pulse Propagation in a Dye-Doped Polymer Slab Waveguide With a Negative Nonlinear Refractive Index," Yamakawa et al., Applied Physics Letters, Vol. 72, No. 13, March 30, 1998.
- CX ✓ "Interferometric All-Optical Switches for Ultrafast Signal Processing," Patel et al., Applied Optics, Vol. 37, No. 14, May 10, 1998.
- CY ✓ "100-Gbit/s Bitwise Logic," Hall et al., Optics Letters, Vol. 23, No. 16, August 15, 1998.
- CZ ✓ "Application of the Polyconjugated Main Chain Polymer DPOP-PPV for Ultrafast All-Optical Switching in a Nonlinear Directional Coupler," Gabler, et al., Chemical Physics, Vol. 245, 1999.
- DA ✓ "All-Optical Routing Using Wavelength Recognizing Switches," Hoanca et al., Journal of Lightwave Technology, Vol. 16, No. 12, December 1998.

- DB ✓ "80 Gbit/s All-Optical Regenerative Wavelength Conversion Using Semiconductor Optical Amplifier Based Interferometer," Kelly et al., Electronics Letters, Vol. 35, No. 17, August 19, 1999.
- DC ✓ "All-Fiber Logical Devices Based on the Nonlinear Directional Coupler," Wang et al., IEEE Photonics Technology Letters, Vol. 11, No. 1, January 1999.
- DD ✓ "Nonlinear Optics for High-Speed Digital Information Processing," Cotter et al., Science, Vol. 286, November 19, 1999.
- DE ✓ "Design Issues of Optical IP Routers for Internet Backbone Applications," Callegati et al., IEEE Communications Magazine, December 1999.
- DF ✓ "All-Optical Clock and Data Separation Technique for Asynchronous Packet-Switched Optical Time-Division-Multiplexed Networks," Toliver et al., Optics Communications, Vol. 173, January 1, 2000.
- DG ✓ "Optical Signal Processing Using Nonlinear Distributed Feedback Structures," Brzozowski et al., IEEE Journal of Quantum Electronics, Vol. 36, No. 5, May 2000.
- DH ✓ "Nonlinear Distributed-Feedback Structures as Passive Optical Limiters," Brzozowski et al., J. Opt. Soc. Am. B, Vol. 17, No. 8, August 2000.
- DI ✓ "Transmission Regimes of Periodic Nonlinear Optical Structures," Pelinovsky et al., Rapid Communications Physical Review E, Vol. 62, No. 4, October 2000.
- DJ "Experimental Demonstration of an All-Optical 2R Regenerator with Adjustable Decision Threshold and "True" Regeneration Characteristics,' Morthier et al., IEEE Photonics Technology Letters, Vol. 12, No. 11, November 2000.
- DK ✓ "All-Optical Time-Domain IP Router Using Optical Limiters," Johnson et al., IEEE, 2000.
- DL ✓ "Optical Properties of Selected Third Order NLO Materials," Chapter 8, pp. 445 – 496.
- DM ✓ "Opto-Mechanical, Electro-Optic, Acoustic-Optic, and Magneto-Optic Switches", Photonic Switching and Computing, pp. 836 – 855.

Examiner: _____

Date Considered: _____

NOTE FOR EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance AND not considered. Include copy of this form with next communication to applicant.

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Section 6. Copies of Listed Information Items Accompanying This Statement

NOTE: 37 C.F.R. § 198(a)(2) requires that any information disclosure statement filed under § 1.97 shall include:

"A legible copy of.:

- (i) Each U.S. patent application publication and U.S. and foreign patent;*
- (ii) Each publication or that portion which caused it to be listed,*
- (iii) For each cited pending U.S. application, the application specification including the claims, and any drawing of the application, or that portion of the application which caused it to be listed including any claims directed to that portion. . .*

Legible copies of all items listed in Forms PTO/SB/08A and 08B (formerly Form PTO-1449) accompany this information statement.

(complete the following, if applicable)

Exception(s) to above:

- ☐ Items in prior application, from which an earlier filing date is claimed for this application, as identified in Section 4.
- ☐ Cumulative patents or publications identified in Section 5.

Section 10. Identification of Persons Making This Information Disclosure Statement

The person making this statement is

(check each applicable item)

- (a) ☐ the inventor(s) who signs below

SIGNATURE OF INVENTOR

(type or print name of inventor who is signing)

- (b) ☐ an individual associated with the filing and prosecution of this application (37 C.F.R. § 1.56(c))

SIGNATURE OF INVENTOR

(type or print name of inventor who is signing)

- (c) ☒ the practitioner who signs below on the basis of the information:

(check each applicable item)

- ☐ supplied by the inventor(s).
- ☐ supplied by an individual associated with the filing and prosecution of this application. (37 C.F.R. § 1.56(c))
- ☒ in the practitioner's file.

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SIGNATURE OF PRACTITIONER

Jeffrey T. Klayman

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(Information Disclosure Statement-Section 10. Identification of Person(s) Making This Information Disclosure Statement [6-1]-page 10 of 10)

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